

**TOSHIBA**

**ADJUSTABLE SPEED DRIVES**

# AS1 Drive

*Reliability in motion<sup>®</sup>*



# Toshiba's New ASD Product Line



*AS1 Product Family*

The AS1 drive builds on Toshiba's history of supplying powerful, reliable, and versatile drives. We have combined our best drive features with the latest technologies, making the AS1 the new contender in the PWM control drive market.

## Advanced Design

The modular construction of the AS1 allows the unit to be installed into nearly any application quickly and easily. The laminated bus-plane technology used in the AS1 means a reduced component count, better reliability, and easier service.

## Simple Programming

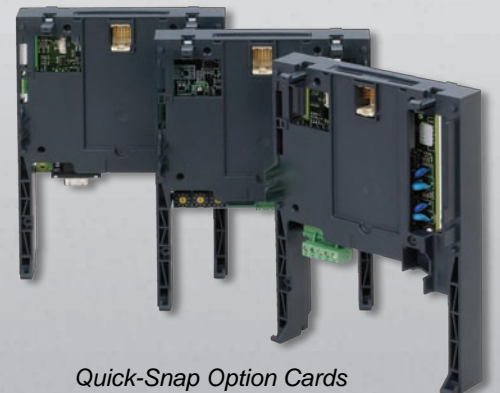
Toshiba's unified programming philosophy means that you can operate the AS1 drive with little or no programming. At the same time, the AS1 maintains one of the most expansive parameter sets in the industry, allowing you to fine-tune the drive for your specific application.

## Tough Environment

The AS1 drive is designed to operate in extreme environments. It can operate in temperatures up to 122°F without derating and can also be configured for use in temperatures of up to 140°F. The AS1 is also designed to be used in a sealed cabinet design. This allows integrators to mount the AS1 heat-sink external to the drive cabinet for simple and efficient cooling of the unit.

## Improved Control

The AS1's new PID algorithm makes it easier than ever to dial in your process control application. New parameters such as a delay filter and a process control lower limit, and new functions such as the AS1's new Speed PID and easy positioning algorithms give the drive expanded capabilities to take on difficult applications.



*Quick-Snap Option Cards*

# Rugged Design, Advanced Operations

## Powerful Performance

The AS1 offers both sensorless and feedback vector control providing heavy duty performance. Using its new Motor-Over-Flux Braking Technology, the AS1 can provide as much as 30% of its rated power for use in stopping a heavy or high inertia load without the use of a dynamic brake resistor.

## Smart Operation

Toshiba's "My Function" programming set allows the AS1 to operate as a simple PLC. Basic logic function programming can now be done directly on the ASD.

## Fault-Tracing

Issues with your application will no longer be a mystery with AS1's fault-tracing algorithm. By accessing the fault-tracing parameters, you can isolate exactly where the trouble is located.

## Easy Communications

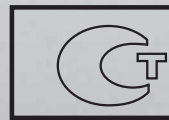
The AS1 is designed to accommodate multiple stackable option cards that mount underneath the unit's keypad quickly and easily. In addition, the drive can accept two inputs from external communication units via the two onboard RS485 communication ports.

## Broad Compliance

The AS1 is certified by a broad range of governing and regulatory bodies making it a truly global product.

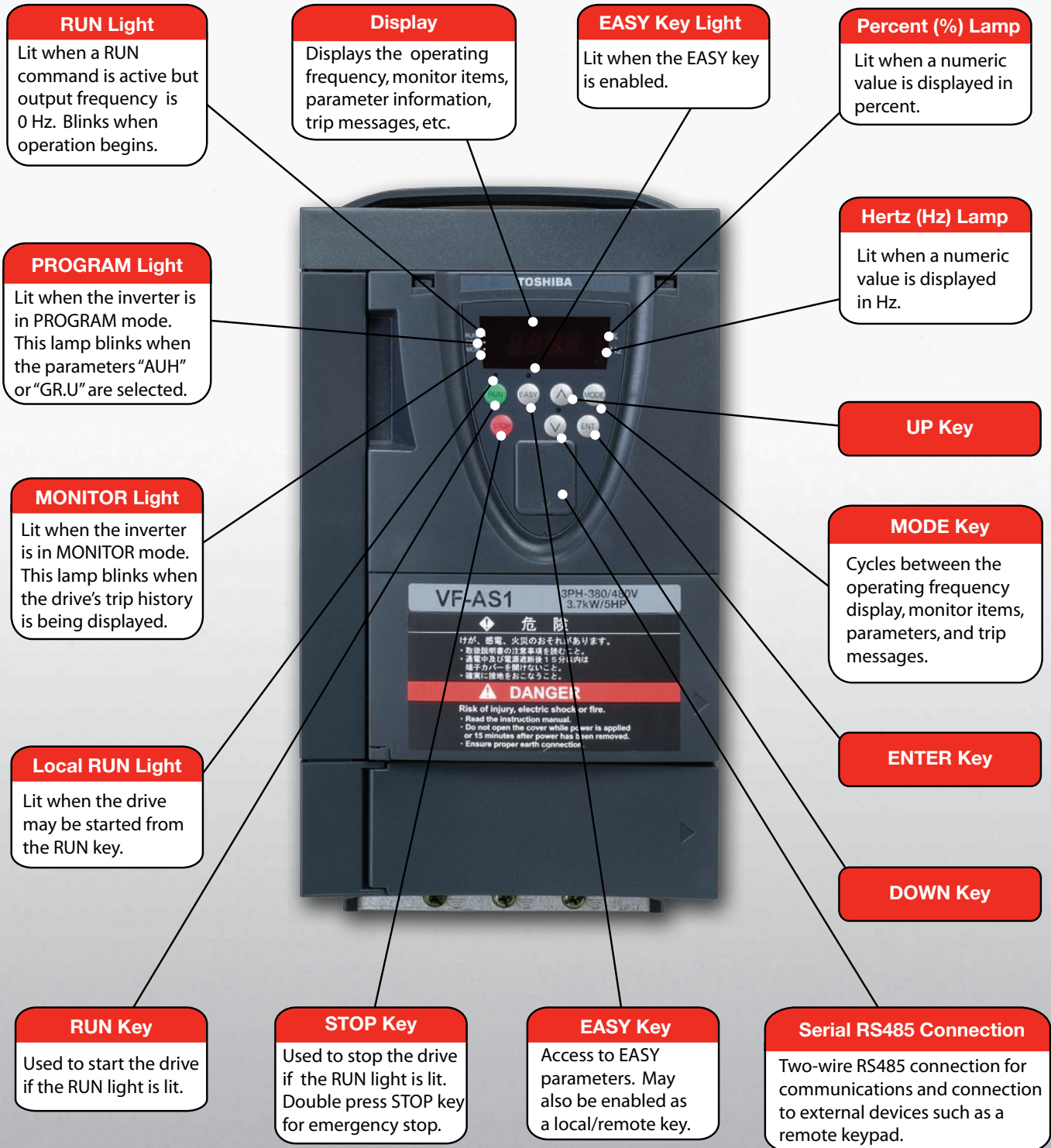


*Large Horsepower AS1*



# Easy-to-Use Operation Panel

## Names and Functions



# AS1 Drive

Standard Specifications																		
Model Range	0.5 to 100 HP				1 to 800 HP				2 to 10 HP				2 to 700 HP					
Voltage Rating	200 to 240 V				380 to 460 V				500 to 600 V				500 to 690 V					
Input Tolerance	Voltage: ±10%, Frequency: ±5%																	
Current Overload	100% Continuous, 150% for 60 Seconds, 165% for 2 Seconds																	
DC Reactor	200 V Input Class, 15 to 60 HP and 400 V Input Class, 25 to 100 HP: Built-In DC Link Reactor; Reactors Required on Larger Units, Optional on Smaller Units (HP)																	
Dynamic Braking	Dynamic Braking Resistor Included on Units < 300 HP; Transistor for Larger Units/Resistor Sold Separately																	
Control System	Sinusoidal Pulse Width Modulation (PWM) Control																	
Output Frequency Range	0 to 500 Hz																	
Frequency Accuracy	Analog Input: ±0.2% of Maximum Output Frequency (at 25 ±10°C); Digital Input: ±0.01% (±0.022 Hz) of Output Frequency																	
Voltage/Frequency Characteristics	Constant Torque, Square Reduction Torque, Auto-Torque Boost, Sensorless and PG Feedback Vector Control, etc.																	
Jump frequencies	Voltage: ±10%, Frequency: ±5%																	
PID Control	Adjustment of Proportional Gain, Integral Time, Differential Time, and Delay Filter																	
Torque Control	Control of Output Motor Torque via Set Point from 0 to 10 V Analog Input																	
PWM Carrier Frequency Adjustment	200 V, 45 kW or 400 V, 75 kW or less, Adjustable Between 1.0 to 16 kHz; 200 V, 55 kW or 400 V, 90 kW or more, Adjustable Between 2.5 to 8 kHz																	
Analog Inputs	0 to 10 Vdc (Input Impedance Zin: 30 kΩ), 0 to ±10 Vdc (Zin: 22 kΩ), 4 to 20 mAdc (Zin: 242 Ω)																	
Analog Outputs	FM Terminal: 0 to 1 mA, 0 to 20 mA, 0 to 10 V; AM Terminal: 0 to 1 mA, Each Programmable to Any of 65 Functions																	
Digital Inputs	Up to 8 Digital Inputs, Each Programmable to 67 Functions, Normally Open or Normally Closed																	
Digital Outputs	One Form-C Relay (FM) Output (250 Vac, 2 A or 30 Vdc, 1 A); Two Open Collector Outputs (24 Vdc, 5 mA)																	
Acceleration/Deceleration Time	0.01 to 6000 Seconds; Four Selectable or Automatic Acceleration/Deceleration Times; Two Adjustable S-Pattern Acceleration/Decelerations																	
DC Braking	Adjustment of DC Braking Start Frequency (0 to 120 Hz), Braking (0 to 100%), and Braking Time (0 to 20 Seconds); Includes Emergency Stop Braking and Motor Shaft Fix Control Functions																	
Forward Run/Reverse Run	F-CC Closed will Forward Run, R-CC Closed will Reverse Run, F-CC and R-CC Closed will Reverse Run; ST-CC Opened will Coast Stop; Emergency Stop Using Panel Operation or Terminal Board																	
Jog Run	Jog Mode Allows Jog Operation from Operation Panel; Jog Run Operation by Terminal Board Possible by Setting Parameters																	
Preset Speed Operation	15 Preset Speeds Available by Switch Input; Programmable Accel/Decel Time; Torque Limit and V/F																	
Retry	Capable of Restarting After Checking Main Circuit Elements in the Event of a Fault; Up to 10 Retries with Adjustable Delay (of up to 10 Seconds) Between Each Retry																	
Soft Stall	Automatic Load Reduction Control in the Event of Overload Condition (Default: OFF)																	
Cooling Fan ON/OFF	Cooling Fan Stops Automatically When Not Needed																	
Operation Panel Key Operation On/Off Control	Keypad Lockout Selectable Between STOP Key Only, MODE Key Only, etc.; All Key Operations can be Prohibited																	
Regen Power Ride Through	In case of a momentary power failure, the VFD can use regen energy to stay powered. (Default: OFF)																	
Auto-Restart Operation	AS1 can catch a spinning motor and safely bring it to speed without faulting. (Default: OFF)																	
Simplified Pattern Operation	Selectable: Eight Patterns in Two Groups from 15 Speed Operations; Maximum 16 Types of Operations Possible; Terminal Board Operation/Repeat Operation Possible																	
Commercial Inverter Switching	Possible to Switch Operation Using Commercial Power Source or Inverter																	
Light Load, High-Speed Operation	Increases Efficiency of Certain Machines by Increasing Rotational Speed of Motor when Operated with Light Load																	
Drooping Function	When Two or More Inverters Operate a Single Load, Drooping Function Helps Evenly Share Load																	
Override Function	Allows User to Add to the Primary Frequency Command. (E.G. Trim input)																	
My Function Operation	My Function provides digital logic and comparator operations as well as timers, counters, and other control functions to provide advanced control operations directly on the VFD (similar to a micro PLC).																	
Color	RAL7016 (Charcoal Gray)																	
Environment	Indoor Use, Non-Corrosive/Non-Combustible Environment; Altitude: 3000 Meters or Less (Derating Necessary for Elevations Over 1000 Meters); Keep Out of Direct Sunlight																	
Ambient Temperature	-10 to +60°C; Remove Upper Cover if 40°C or Higher, Maximum 60°C with De-Rate)																	
Storage Temperature	-25 to +70°C																	
Relative Humidity	20 to 93% (Free from Condensation)																	
Vibration	5.9 m/s <sup>2</sup> (0.6 G) or Less (10 to 55 Hz)																	
AS1	Frame Size																	
	H*	2	3	4	5A	5B	6	7A	7B	8	9	10	11	12	13	14	15	H*
	W*	9.1	10.2	11.6	11.6	15.7	16.5	21.7	21.7	24.8	26.8	30.8	37.4	37.4	37.4	45.3	45.3	W*
	D*	5.1	6.1	6.9	8.3	9.1	9.4	9.4	12.6	12.6	12.2	13.8	13.0	16.9	23.0	34.6	43.6	D*
	D*	6.0	6.5	6.5	7.5	7.5	8.3	9.5	9.5	11.4	14.6	14.6	14.6	14.6	14.6	14.6	14.6	D*
Voltage	200-240 V	0.5-2	3-5	7.5	10	15-20	25-30	-	40-60	75	100	-	-	-	-	-	HP	
	380-460 V	1-3	5	7.5-10	15	20-25	30	40-50	-	60-100	125	150	200	250	300-450	550-600		700
	500-600 V	-	-	-	2-10	-	-	-	-	-	-	-	-	-	-	-		-
	500-690 V	-	-	-	-	-	3-30	-	-	40-100	-	-	125-200	-	250-450	-		500-800
Enclosure Rating	IP20*									IP00*								

\*IP20 Approximately Equal to NEMA 1; IP00 Provides No Protection, Chassis Unit

Unit's Horsepower

Unit's Dimensions

# TOSHIBA INTERNATIONAL CORPORATION



North American Headquarters & Manufacturing Facility (Houston, TX)

## TOSHIBA – Quality by Design

Toshiba's culture and history are strongly rooted in quality. Our designs are technologically innovative, and our products are manufactured from start to end using only the highest quality domestic and foreign parts.

## Product Warranty

Toshiba offers a comprehensive warranty program on its full line of industrial products. Consult your salesperson or the factory for specific information.

## Need to Know More?

Be sure to visit our website located at [www.toshiba.com/ind](http://www.toshiba.com/ind) for the latest information on Toshiba products and services.

## Customer Support Services

Toshiba offers 24-hour service nationwide. For assistance of any type call: 1-800-231-1412.



**ADJUSTABLE SPEED DRIVES   MOTORS   CONTROLS   UPS   INSTRUMENTATION   PLC**

# TOSHIBA

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